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COMPUTER DECISIONS

JUNE 3, 1986

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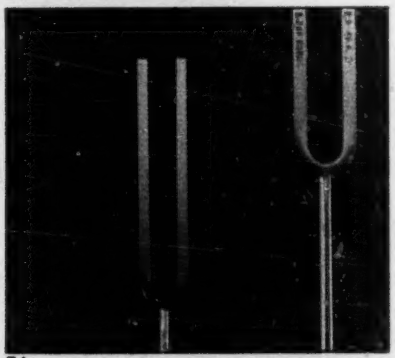

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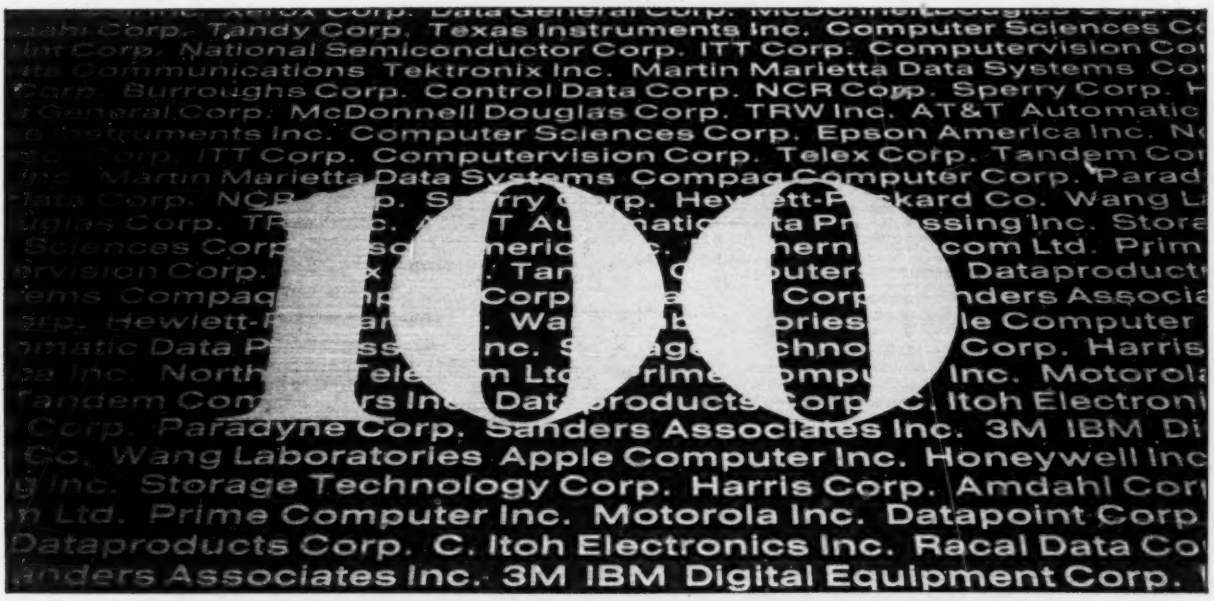
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Sanders Associates Inc. 3M IBM Digital Equipment Corp.

THE YEAR THE PARTY ENDED

1985 was a year of troubles for a dp industry that expected many happy returns.

by Lee Keough, Industry Editor

For the data processing industry, last year was a hangover after a frenzy of selling. The worst part of the downtrend: the aftereffects of plant closings, layoffs, and sales declines continued into the first half of this year.

Some industries would be happy to grow at the 9.2 percent rate achieved by the *Computer Decisions* 100, but this is a paltry number to corporations accustomed to growth rates of 20 percent or higher. Viewed in relation to the rest of the economy, the *Computer Decisions* 100 (see list on pages 60-61) had a mediocre, but not disastrous, year.

Last year, almost every market segment turned soft, with the exception of supercomputers, add-on products for microcomputers, and dp services. The U.S. Department of Commerce pegs the 1985 growth rate for domestic computer manufacturers at 8 percent, although it says software revenues grew by a robust 23 percent. Analysts at the Commerce Department say the weakest markets were mainframes and 16-bit minicomputers.

Commerce Department analysts had expected this year to be slightly better, predicting a 16 percent sales growth in equipment and a 25 percent

COMPUTER DECISIONS 100

	'85	'84	Company	'85 Revenues (000)	'85/'84 Growth (%)	'84 Revenues (000)
	1	1	IBM (Armonk, NY)	48,100,000	9.6	43,900,000
	2	2	Digital Equipment Corp. (Maynard, MA)	7,029,407	12.8	6,229,629
	3	3	Burroughs Corp. (Detroit)	4,812,700	6.5	4,520,800
	4	4	Sperry Corp. (New York)	4,755,000	18.4	4,015,000
▲	5	6	NCR Corp. (Dayton, OH)	3,894,132	6.3	3,664,748
▲	6	7	Hewlett-Packard Co. (Palo Alto, CA)	3,726,600	14.0	3,269,000
▼	7	5	Control Data Corp. (Minneapolis)	3,679,700	−0.3	3,692,600
	8	8	Wang Laboratories Inc. (Lowell, MA)	2,428,300	0.3	2,421,145
▲	9	10	Honeywell Inc. (Minneapolis)	1,951,900	7.0	1,825,000
▼	10	9	Apple Computer Inc. (Cupertino, CA)	1,753,873	−7.6	1,897,944
▲	11	15	AT&T (New York)	1,740,000	61.1	1,080,000
▼	12	11	Xerox Corp. (Stamford, CT)	1,609,000	11.2	1,446,600
▲	13	14	TRW Inc. (Cleveland)	1,450,000	31.2	1,105,000
▼	14	12	Data General Corp. (Westboro, MA)	1,199,028	−4.4	1,254,200
▲	15	17	McDonnell Douglas Corp. (St. Louis)	1,119,000	26.0	888,000
	16	16	Automatic Data Processing Inc. (Roseland, NJ)	1,102,097	15.0	958,287
▲	17	19	General Motors / Electronic Data Systems (Dallas)	978,300	12.9	866,600
▲	18	22	Tandy Corp. (Fort Worth, TX)	910,000	26.6	719,060
▲	19	24	Computer Sciences Corp. (El Segundo, CA)	867,000	22.2	709,634
▲	20	21	Amdahl Corp. (Sunnyvale, CA)	862,032	10.6	779,400
▼	21	18	General Electric Co. (Fairfield, CT)	855,000	−2.3	875,000
▼	22	13	Commodore International Ltd. (West Chester, PA)	798,600	−34.0	1,209,400
▲	23	26	Prime Computer Inc. (Natick, MA)	769,673	19.7	642,779
▼	24	23	Texas Instruments Inc. (Dallas)	760,000	6.5	713,640
▲	25	27	Motorola Inc. (Schaumberg, IL)	704,000	13.9	618,000
▼	26	20	Storage Technology Corp. (Louisville, CO)	673,400	−16.7	808,584
▲	27	29	National Semiconductor Corp. (Santa Clara, CA)	650,000	8.3	600,000
▲	28	32	Tandem Computers Inc. (Cupertino, CA)	634,546	22.4	518,414
▲	29	30	ITT (New York)	625,000	8.7	575,000
▼	30	25	Northern Telecom Inc. (Nashville, TN)	600,000	−7.7	650,000
▲	31	35	Telex Corp. (Tulsa, OK)	597,426	34.9	442,735
▲	32	33	Harris Corp. (Melbourne, FL)	542,000	7.7	503,100
▲	33	37	Intergraph Corp. (Huntsville, AL)	526,405	30.4	403,762
	34	34	Epson America Inc. (Torrance, CA)	520,000	4.0	500,000
▲	35	44	Compaq Computer Corp. (Houston)	503,880	57.5	320,000
▼	36	31	Computervision Corp. (Bedford, MA)	441,944	−20.6	556,342
▲	37	41	Martin Marietta Corp. (Bethesda, MD)	429,900	18.9	361,600
▲	38	42	GTE Corp. (Stamford, CT)	420,000	16.7	360,000
▼	39	28	Datapoint Corp. (San Antonio, TX)	414,682	−30.9	600,539
▲	40	50	Cray Research Inc. (Minneapolis)	380,158	66.2	228,752
▼	41	39	Tektronix Inc. (Beaverton, OR)	367,000	−5.1	386,600
▲	42	48	Zenith Electronics Corp. (Glenview, IL)	352,000	41.4	249,000
	43	43	3M (St. Paul, MN)	350,000	1.3	345,500
▲	44	46	Sanders Associates Inc. (Nashua, NH)	329,600	24.7	264,300
▼	45	40	The Racal Corp. (Boca Raton, FL)	328,000	−13.9	381,000
▲	46	47	Shared Medical Systems Corp. (Malvern, PA)	312,207	21.6	256,753
—	47	—	Eastman Kodak Co. (Rochester, NY)	300,000	—	—
▲	48	53	Apollo Computer Inc. (Chelmsford, MA)	295,575	36.9	215,930
	49	49	Contel Corp. (Atlanta)	277,800	14.6	242,400
▼	50	45	Paradyne Corp. (Largo, FL)	252,529	−12.9	289,981

—Not ranked among Computer Decisions 100 in 1984.

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	'85	'84	Company	'85 Revenues (000)	'85/'84 Growth (%)	'84 Revenues (000)
▲	51	58	Xidex Corp. (Mountain View, CA)	249,727	27.9	195,288
—	52	—	MAI Basic Four Inc. (Tustin, CA)	249,000	—	N/A
▼	53	52	Liebert Corp. (Columbus, OH)	248,243	14.0	217,744
▲	54	55	Gould Inc. (Rolling Meadows, IL)	248,000	19.5	207,500
—	55	—	Sterling Software Inc. (Dallas)	237,224	291.8	60,550
▼	56	54	The Boeing Co. (Seattle)	225,000	7.1	210,000
▲	57	72	Lotus Development Corp. (Cambridge, MA)	225,000	43.3	156,978
▲	58	62	Planning Research Corp. (McLean, VA)	218,874	17.5	186,261
▲	59	66	Centronics Data Computer Corp. (Hudson, NH)	216,000	25.9	171,504
▼	60	51	Schlumberger Ltd. (New York)	214,000	-4.9	225,000
▼	61	56	Gerber Scientific Inc. (Hartford, CT)	210,387	3.8	202,616
▼	62	61	Quotron Systems Inc. (Los Angeles)	205,686	8.4	189,799
▲	63	65	UCCEL Corp. (Dallas)	204,714	18.0	173,433
▲	64	68	Bell Atlantic Corp. (Philadelphia)	202,000	18.8	170,000
▲	65	67	Micom Systems Inc. (Simi Valley, CA)	194,246	13.4	171,323
▲	66	69	The Reynolds & Reynolds Co. (Dayton, OH)	192,926	16.3	165,834
—	67	—	Okidata Corp. (Mt. Laurel, NJ)	190,000	—	—
—	68	—	HBO & Co. (Atlanta)	189,000	113.1	88,682
▲	69	73	Cullinet Software Inc. (Westwood, MA)	185,595	23.3	150,484
▼	70	57	NEC Information Systems Inc. (Boxborough, MA)	184,000	-8.0	200,000
	71	71	General Datacomm Industries Inc. (Middlebury, CT)	179,382	11.2	161,263
▼	72	64	NBI Inc. (Boulder, CO)	172,000	-2.8	176,864
▲	73	92	AST Research Inc. (Irvine, CA)	170,965	46.5	116,710
▲	74	93	Computer Associates International Inc. (Garden City, NY)	170,400	46.8	116,091
▼	75	74	Decision Data Computer Corp. (Horsham, PA)	167,000	13.6	147,017
▲	76	94	MTech Corp. (Dallas)	165,000	42.2	116,000
▼	77	76	Recognition Equipment Inc. (Irving, TX)	163,147	16.4	140,140
▲	78	84	Microsoft Corp. (Redmond, WA)	162,400	29.9	125,000
▼	79	78	ISC Systems Corp. (Spokane, WA)	161,518	16.4	138,703
▲	80	85	Telerate Inc. (New York)	161,163	31.5	122,566
—	81	—	Intelogic Trace Inc. (San Antonio, TX)	159,097	—	N/A
▼	82	60	Diebold Inc. (Canton, OH)	158,000	-16.8	190,000
▼	83	75	Management Science America Inc. (Atlanta)	151,661	6.9	141,816
▼	84	83	Ameritech Inc. (Chicago)	150,000	17.0	128,200
—	85	—	Sun Microsystems Inc. (Mountain View, CA)	147,100	112.3	69,300
▼	86	77	National Data Corp. (Atlanta)	146,545	4.7	139,961
▼	87	63	CPT Corp. (Minneapolis)	139,276	-22.0	178,636
—	88	—	Mentor Graphics Corp. (Beaverton, OR)	136,700	55.5	87,900
—	89	—	Daisy Systems Corp. (Mountain View, CA)	133,637	63.8	81,572
▼	90	89	Hayes Microcomputer Products Inc. (Norcross, GA)	133,000	10.8	120,000
▼	91	86	Altos Computer Systems (San Jose, CA)	132,182	8.5	121,829
▲	92	97	Commerce Clearing House Inc. (Chicago)	126,803	11.3	113,962
▼	93	91	Floating Point Systems Inc. (Beaverton, OR)	126,568	6.9	118,415
▼	94	80	Intecom Inc. (Allen, TX)	123,600	-6.1	131,678
▼	95	87	Intelligent Systems Corp. (Norcross, GA)	122,712	1.2	121,297
—	96	—	Wyse Technology (San Jose, CA)	120,478	102.0	59,640
▼	97	95	Anacomp Inc. (Indianapolis)	120,000	3.6	115,779
—	98	—	Bolt, Beranek and Newman Inc. (Cambridge, MA)	120,000	44.6	83,000
▼	99	82	Dun & Bradstreet Corp. (New York)	120,000	-7.7	130,000
	100	100	National Computer Systems Inc. (Eden Prairie, MN)	117,500	17.9	99,656

The Computer Decisions 100 includes vendors whose revenues from sales to end users constitute 50 percent or more of total data-processing revenues.

increase in software. But this prediction may be optimistic, analysts now concede. Equipment orders tracked through the end of March are relatively flat compared to last year, according to the Commerce Department's Bureau of the Census.

What's gone wrong? The debate among analysts and vendors has been lively, but a lackluster economy, which has been particularly weak among manufacturers, is the most oft-cited cause. John F. Akers, chairman and CEO of IBM, originally blamed the strong dollar for much of IBM's slump in sales. But now that the value of the dollar has dropped, he blames user uncertainty over tax-reform legislation, among other reasons.

Kenneth H. Olsen, president of Digital Equipment Corp., Maynard, MA, the second largest dp vendor, agrees that tax reform proposals have affected buying patterns. Tax revisions in 1981 helped spur the surge in capital equipment spending until last year, he notes. Another factor is that corporations, after a microcomputer buying spree, are now pausing to evaluate their investments, says Olsen. As corporations attempt to build corporatewide networks, executives demand that equipment will communicate between departments. As a result, says Olsen, all computer purchases are being studied at the highest corporate level, causing longer evaluations. "It's becoming a top-down decision," says Olsen.

William F. Zachmann, industry observer at International Data Corp., Framingham, MA, believes the problem is much more fundamental. Zachmann, one of the few analysts who predicted the slump would be deep, says the computer industry is undergoing "a changeover from traditional systems to microprocessor-based systems." For the first time, users are finding that smaller systems give them better price/performance than larger systems, he says.

As an example, Zachmann says the cost of 1 million instructions per second (MIPS) on an IBM 3090 mainframe is more than $180,000, compared to $110,000 for 1 MIPS on an IBM 4381. The same power on a DEC VAX system, says Zachmann, ranges from $60,000 to $80,000 and 1 MIPS on a MicroVAX II costs $45,000. To place numerous applications on a mainframe "no longer makes economic sense," he says. If Zachmann's theory proves correct, it would explain why IBM has been hit harder than some other vendors. With its emphasis on mainframes, IBM has the most to lose from a trend toward smaller computers.

The "Zachmann effect" may be hurting other mainframe vendors as well, particularly the Bunch (Burroughs, Sperry, formerly Univac,

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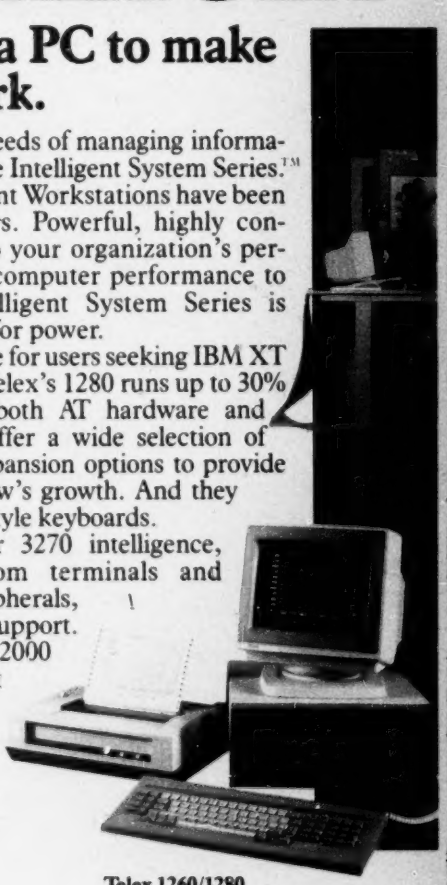

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NCR, Control Data, and Honeywell). With the exception of Sperry, each had a dismal 1985, fighting IBM's increasing dominance as well as the move to distributed setups of smaller systems.

Sperry was a surprise, reporting an 18.4 percent increase in revenues over 1984. Sperry's top-of-the-line mainframe, the 1100/90, was introduced in 1984, and an entire year of bulk shipments helped increase Sperry's revenues. A Sperry spokesman also credits the vendor's success to a strong increase in microcomputer orders. Last year Sperry began shipments of Unix-based minis and micros and introduced two new IBM-compatible micros.

Sperry performed so well in 1985 that it nearly bumped Burroughs out of the number three position. Ironically, it may be the last year Sperry has a chance to regain the number three ranking it once enjoyed. At press time, Burroughs' second bid for Sperry in a year makes a takeover of the New York-based vendor likely.

Like Sperry, Burroughs also introduced a new mainframe series last year, but gains from the new system were partially offset by losses in its Memorex line of plug-compatible peripherals and storage devices.

One large vendor that achieved a modicum of success last year was minicomputer vendor Hewlett-Packard Co. Its computer revenues jumped 14 percent, which Grant Bushee, executive vice president of Infocorp, a Cupertino, CA, market-research house, says is a credit to its marketing forces. "Hewlett-Packard has done amazingly well with an obsolete, 16-bit architecture," he says. Bushee says 1986 will be a different story, as users are expected to hold off buying Hewlett-Packard computers in anticipation of its new Spectrum line of reduced instruction set computer (RISC) processors.

The *Computer Decisions* 100 lists 11 new names this year. Several vendors make the list for the first time due to mergers and divestitures.

Eastman Kodak appears on the list by virtue of its acquisition of Verbatim Corp., Sunnyvale, CA, as well as its drive into computerized publishing. Intelogic Trace is the former maintenance arm of Datapoint, spun off after Datapoint's takeover by arbitrageur Asher B. Edelman. Edelman was also responsible for dismantling two former *Computer Decisions* 100 vendors, Management Assistance Inc. and Mohawk Data Sciences. MAI Basic Four appears on the ranking in place of Management Assistance. Sorbus, formerly the maintenance subsidiary of Management Assistance, was bought by Bell Atlantic in 1984.

Another Bell holding company that appears is Ameritech, which bought

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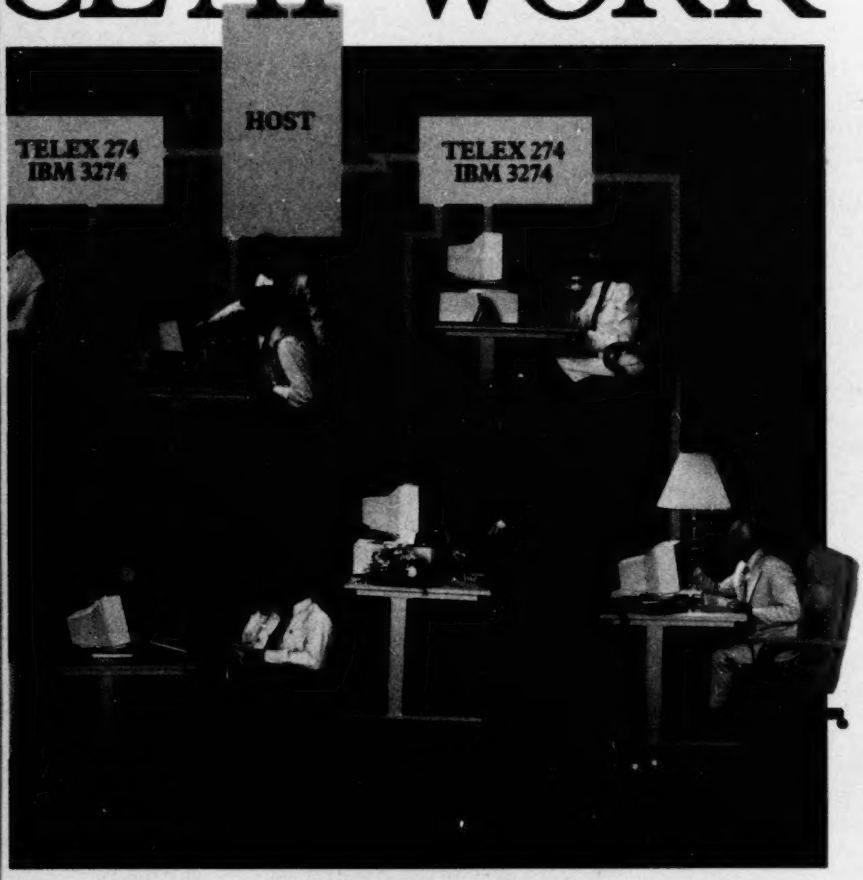

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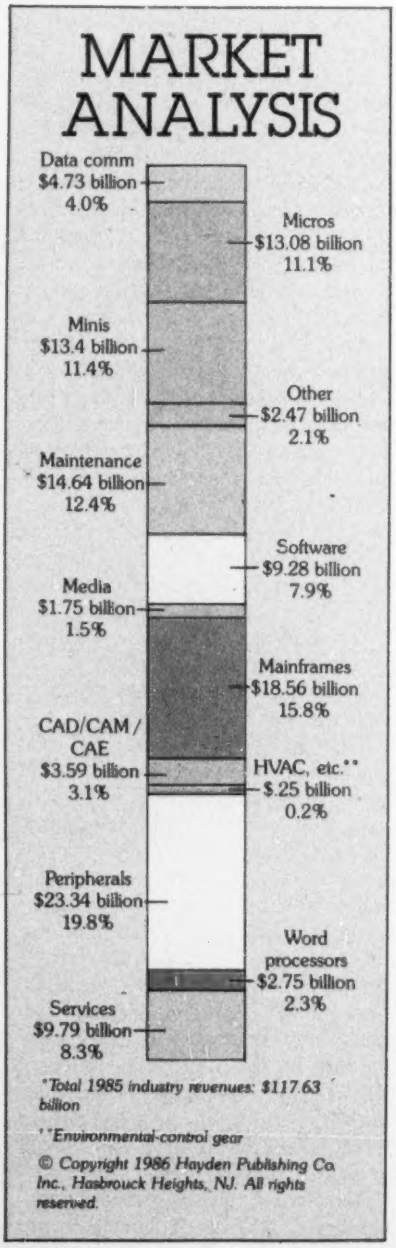
systems software vendor Applied Data Research, Princeton, NJ. Sterling Software purchased Informatics General, a software company 10 times its size, and thus appears both for the first time and as the largest software vendor. HBO & Co. made two acquisitions, both of which provide data processing products and services to the health care industry.

Despite the industry slowdown, some vendors achieved success due to internal growth. The market for computer-aided engineering (CAE) systems ballooned.

The presence of terminal-maker Wyse Technology proves a vendor doesn't always need a hot market to soar to the top. Few markets have been as pressured as the terminal market, as evidenced by the fall of former



IBM PROSPECTS FOR RICH FRONTIERS

Gracing the cover of IBM's 1985 annual report is, of all things, a Buick. An auto worker leans across the car to reach an IBM terminal.

The photograph may be a surprising choice of images for the world's premier computer vendor, but it highlights a new reality for IBM. IBM can no longer expect mere renewal and replacement of its many product lines to spur growth, says Thomas Henkel, an analyst at the Yankee Group, Boston. High growth will only come from expansion into new businesses, like manufacturing automation and communications. Without new markets, IBM's gigantic size may limit it to more conservative growth rates, despite continued domination of the information-processing market.

John F. Akers, IBM chairman and chief executive officer, recently conceded to shareholders that "the year's performance did not come up to our own expectations." Saying 1985 was "a very tough year for the industry," Akers noted, "IBM did not emerge unscathed."

Akers' remark accurately reflected IBM's 1985 performance. Just a year earlier, Akers predicted "solid growth" for 1985, saying "prospects have never been brighter" for IBM. But IBM ended the year with $50.2 billion in total revenues, an increase of less than 9 percent over 1984. *Computer Decisions* estimates that IBM's revenues from the sale of data processing products and services increased only 9.6 percent, to $48.1 billion. Earnings, in which IBM normally excels, declined by $30 million, to $6.55 billion.

Even those disappointing results could have been much worse if IBM had not hiked the price of its software and moved up scheduled shipments of its new 3090 mainframe, contends Bob Djurdjevic, president of Annex Research, a Phoenix consultancy. IBM software revenues increased last year by more than 30 percent over 1984. IBM did it by dramatically increasing the price of its operating system software, a market in which IBM has no competition. Revenues from maintenance services—another relatively captive IBM market—also increased at a higher rate than overall business. Other achievements were a 14 percent revenue increase from storage devices and a 32 percent revenue increase from the personal-computer line.

> "Users are starting to realize that the cost of an IBM mainframe is out of line."
>
> *Zachmann, IDC*

These successes mask underlying problems, say many analysts, problems to which there are no immediate solutions. Many IBM-watchers are predicting that IBM's lackluster financial performance last year is only the beginning of several single-digit growth years for what many consider the United States' premier manufacturer.

Analysts cite myriad reasons for IBM's current difficulties, ranging from incompatibility between IBM systems to a fundamentally weak domestic economy. They are divided over whether IBM's 3090 mainframe, introduced last year, is meeting IBM's expectations. Djurdjevic and others say the 3090 is selling moderately well.

leader Televideo Systems Inc. (Sunnyvale, CA) from the ranking. Wyse climbed onto the *Computer Decisions* 100 simply by offering an attractively priced product line.

Understanding how some succeeded in spite of the computer slump of 1985 may be small consolation to the majority of vendors. They've got another tough year to cope with as 1986 sales remain soft, leaving few growth opportunities. In this climate, vendors will need more than appealing products to hang on until the good times start to roll again. □

Francis Gens of International Data Corp. (IDC), a market research house based in Framingham, MA, and Brian Jeffery of International Technology Group, Palo Alto, CA, say 3090 sales have been disappointing.

"The 3090 is a big problem," says Jeffery. "It's quite unprecedented for a new mainframe to get such a weak reception. IBM has cut prices and accelerated deliveries, and the 3090 is still weak." Gens blames a lack of differentiation between the 3090 and the 308X mainframe, IBM's former top-of-the-line mainframe, as one reason for the 3090's disappointing performance. But Gens adds that larger economic issues are also having an effect. Traditional volume purchasers of mainframes, such as government agencies and petrochemical producers, are facing budget squeezes, says Gens.

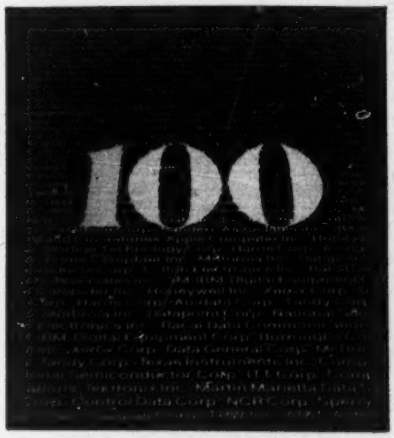
Djurdjevic believes IBM will have to fend off the 3090's competitors after the plug-compatible vendors start volume shipments of new mainframes next year. That's why he, too, is predicting future single-digit growth rates for IBM.

The most important long-term issue facing IBM, according to Gens and William F. Zachmann, an IDC analyst, is the movement away from centralized mainframes to combinations of smaller competitors. Users are finding they can gain price/performance benefits by moving applications to smaller systems. "Users are starting to realize that the costs of an IBM mainframe system are totally out of line," says Zachmann.

Because IBM gains most of its profits from its mainframes, Zachmann predicts that IBM will have a quarterly loss in 1987 or 1988. Although Gens agrees with Zachmann, he believes IBM's slippage will be more gradual. Users will not move existing applications off their mainframes, says Gens, but will build new applications on smaller systems.

Not all analysts believe that IBM's problems are due to a waning interest in mainframes, but they agree that IBM's future is uncertain. IBM's financial performance is no longer predictable, they say, because IBM has become a slave to user demand. By converting its customers from rental to purchase, IBM can no longer control its revenue stream by increasing prices to a captive rental market, they note.

In addition to a sluggish economy at



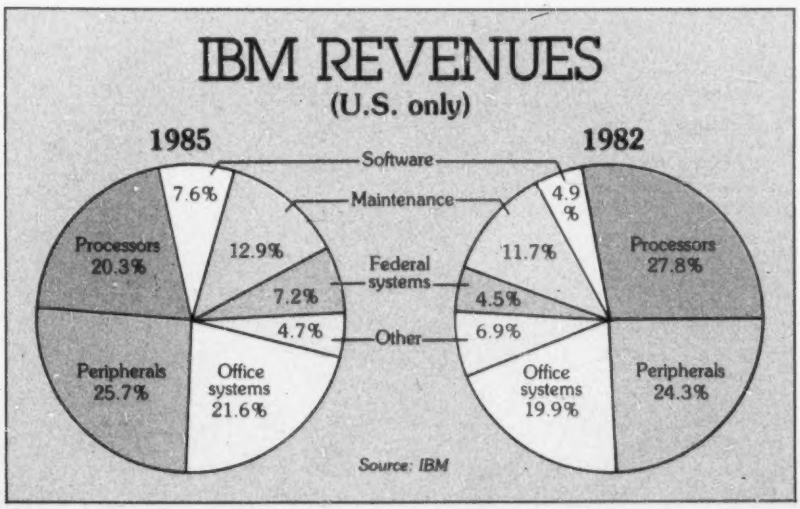
home, IBM has blamed its slowdown on a lack of demand for its intermediate systems. Analysts say this is no surprise because IBM minicomputers are not as attractive as the competition's, and IBM lacks the communications strategy that would overcome this deficiency.

"The IBM world is extraordinarily messy and irrational in many ways," says Zachmann. For that reason, Gens predicts that IBM will allow all systems, except those based on the 370 architecture, the IBM PC, and the System/36 minicomputer, to quickly fade. The only reason IBM will continue to embrace the System/36, says Gens, is because of its large user base.

Yet, for all the talk about demand, IBM is selling more, not fewer, computers. The dilemma is that IBM's capacity to make and sell products greatly outweighs the demand for them. Between 1980 and 1985, IBM made an investment in plants and equipment of more than $20 billion.

Djurdjevic estimates that at the end of 1985, IBM's inventory had a market value of $29 billion. To work that off, IBM is going to have to cut prices, Djurdjevic believes, and that will eventually put a squeeze on profits.

What can IBM do? It has already instituted an austerity program, cutting



travel expenses and hiring. Other measures include plant consolidation and the sale of its retail stores.

But austerity measures won't be enough if IBM does not score successes in new markets. For that reason, IBM has introduced a vector processor for scientific and engineering uses, made a push into manufacturing with new industrial computers and the IBM RT PC, and tried to provide systems integration services. Its largest investment in a new market has been in communications, with its 1984 purchase of private branch exchange (PBX) maker Rolm Corp., and its 1985 purchase of a major stake in the second largest long-distance communications vendor, MCI Corp., Washington.

This push into communications has thus far produced disappointing results, notes Eric Arnum, editor of *Telecom/IBM*, a newsletter published

FOR SOME, THE PARTY LINGERS

Some of the *Computer Decisions* 100 sailed through 1985 as if the worldwide clamor for computers had continued to grow. A glance at the growth rates of these 20 hale and hearty vendors (see chart) proves that slackened demand for dp products and services was not universal.

AT&T, generally considered a weakling in the computer industry, may be the most startling name on this list. Its stellar performance is largely due to a new line of private branch exchanges (PBXs)—the first upgrade in several years—that overwhelmed the competition. AT&T also achieved success with its IBM-compatible micro, the AT&T 6300, although its effort to market Unix-based micros fell flat.

The real test for AT&T should occur over the next few years. Analysts note that AT&T is beginning to battle for control of the desktop with the introduction of Starlan, its local-area network. AT&T's strategy is to gain a presence in data processing by linking its telecommunications products through Starlan to its data terminals and micros, says Kathryn Korostoff, an analyst with Northern Business Information, New York. Because of AT&T's huge installed base of PBXs, Korostoff says, Starlan has the potential to dramatically change the telephone giant's role as a dp vendor. Another boost to AT&T's growth may come from relaxation of government regulations prohibiting AT&T from selling its dp products along with its telecommunications products.

Two other micro vendors, Compaq Computer Corp. and Zenith Electronics Corp., were once again among the top performers, demonstrating that the corporate appetite for micros is largely unsated even if the market for non-IBM compatible micros seems to have crashed. Vendors in related markets also continued to do well. AST Research Inc., maker of add-on products for IBM, Apple, and Digital Equipment computers, cashed in on the popularity of products like its Six Pak Plus multifunction board.

High-flier Lotus Development Corp., marketer of the 1-2-3 spreadsheet package, remains the leading independent vendor of micro software. Recently, Lotus has been on an acquisition tear, possibly to blunt Wall Street criticism that it is a one-product company. It is too soon to tell whether these acquisitions can keep Lotus' growth at current rates.

Computer Associates International Inc., Sterling Software, and HBO & Co. made the list of top performers largely through acquisitions. But the three vendors also demonstrated market strength beyond the initial benefits of acquisitions.

MTech and Telerate provide dp services to the financial industry, a high-growth market. MTech provides software and services to banks, while Telerate provides the system needed to obtain immediate quotations for federal securities and precious metals.

Wyse Technology and Telex Corp. are succeeding in the difficult periph-

HALE AND HEARTY

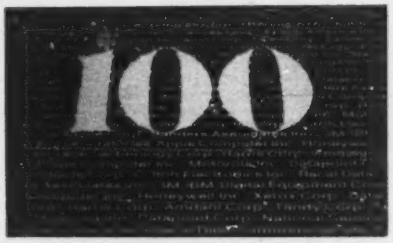
Company	'85/'84 Growth (%)	'85/'84 Rank
Sterling Software Inc.	291.8	55/–
HBO & Co.	113.1	68/–
Sun Microsystems Inc.	112.3	85/–
Wyse Technology	102.0	96/–
Cray Research Inc.	66.2	40/50
Daisy Systems Corp.	63.8	89/–
AT&T	61.1	11/15
Compaq Computer Corp.	57.5	35/44
Mentor Graphics Corp.	55.5	88/–
Computer Associates International	46.8	74/93
AST Research Inc.	46.5	73/92
Bolt, Beranek and Newman Inc.	44.6	98/–
Lotus Development Corp.	43.3	56/72
MTech Corp.	42.2	76/94
Zenith Electronics Corp.	41.4	42/48
Apollo Computer Inc.	36.9	48/53
Telex Corp.	34.9	30/35
Telerate Inc.	31.5	80/85
TRW Inc.	31.2	13/14
Intergraph Corp.	30.4	33/37

—*Not ranked among* Computer Decisions *100 in 1985.*

by market researcher International Resource Development Inc., Norwalk, CT. However, it is much too early to write it off as a failure. Analysts say IBM has yet to break even on its investment in Rolm, but Arnum says that is to be expected because there is no real integration between the product lines. This will change in about three years, he says, noting that joint IBM/Rolm research is accelerating.

Jeffery paints a darker future for IBM. "Even if IBM succeeds in diversifying into telecommunications and factory automation, it will be just a drop in the bucket," he says. "The fact is, the Big Blue growth machine is no more."

Akers may not agree with Jeffery's harsh assessment, but he does admit that IBM fortunes won't change immediately. As he recently told stockholders, IBM "faces a demanding year ahead." □



erals business. Wyse manufactures low-cost ASCII terminals. Telex is a vendor of IBM 3270-compatible peripherals.

Other top performers took advantage of new and growing markets. Sun Microsystems Inc., Daisy Systems Corp., Apollo Computer Inc., and Mentor Graphics market micro-based workstations for use in computer-aided engineering (CAE) applications. Demand for scientific computers has boosted performance for Cray Research Inc., a manufacturer of supercomputers.

What are the long-term prospects for these vendors? Even vendors of the hottest products can be surprised when user interest suddenly cools. The CAE market slowed late last year; Daisy Systems, Mentor Graphics, and Apollo all had trouble maintaining high growth rates. Sun Microsystems racked up record sales, but is falling short of profit goals this year.

The abrupt slowdown in CAE systems is only the most recent market setback for the dp industry. The top performers on the *Computer Decisions* 100 are high fliers only in relation to others in the industry. The 20 best performers of a year ago all had growth rates of at least 50 percent. This year, vendors with growth rates of 30 percent are singled out for their achievements. Thus, 1985 left even the industry's top performers wondering if the growth rates of old are gone forever. □

UP & COMERS: BREAKING OUT OF THE PACK

Despite an industrywide slump—or perhaps because of it—1985 was a charmed year for some data processing vendors. Seven vendors, the *Computer Decisions* Up & Comers, reported revenue growth of at least 50 percent and sales of more than $50 million. If good fortune stays with them, it won't be long before these vendors rank among the *Computer Decisions* 100.

Three of this year's Up & Comers are repeat performers—Iomega Corp., Ashton-Tate, and Digital Communications Associates Inc. (DCA). Each markets products for microcomputers.

Iomega, maker of the Bernoulli Box micro storage system, barely missed a place on the *Computer Decisions* 100 after more than doubling its 1984 sales. Although the Bernoulli Box was originally created as a disk drive for the original equipment manufacturer (OEM) market, most of Iomega's success has come from selling the product directly to end users, as either an expansion or backup storage system. The Bernoulli Box boasts the speed and capacity of a hard-disk drive, as well as the durability and portability of a floppy-disk drive.

Iomega's early failure to convince OEMs to purchase its unique device may have saved the vendor from a market setback, because it was not dependent on sales to microcomputer vendors. "Iomega is just starting to get into the OEM market," says Kenneth Leung, an analyst with the New York stock brokerage of Smith Barney, Harris Upham & Co. OEMs were reluctant to buy the Bernoulli Box at its inception because Iomega was a startup and the only supplier of the design. Leung expects Iomega will have more success with its new disk drive for OEMs. He also believes Iomega's sales to end users will continue to grow, because he anticipates no slowdown in the add-on micro market.

With the success of its database packages, Ashton-Tate continues to climb to the top.

That's good news for Ashton-Tate, which recently began marketing its dBase III Plus software for networked micros. With the success of its database packages, Ashton-Tate continues to steadily climb into the top echelon of software vendors. "Ashton-Tate's dBase packages have a real lock on the market," says Ruthann Quindlen, an analyst with Alex Brown and Sons Inc., a Baltimore-based stock brokerage.

Ashton-Tate's late-1985 acquisition of Multimate International Corp., producer of Multimate, a best-selling word processing package, should fuel this year's growth. With the release of three new packages, including one for the Macintosh from Apple Computer Corp., Cupertino, CA, expected by the end of this year, Quindlen says 1986 should be another banner sales year.

DCA is still riding the crest of the success of its Irma line of micro-to-

(Continued on page 70)

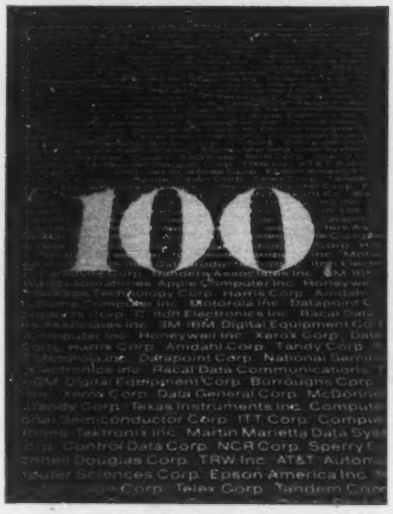
(Continued from page 67)

mainframe links. But DCA has also done an "outstanding job" of developing enhancements and additions to its family of wide-area networking products, says Andrew Schopick, an analyst with Gartner Securities Corp., Stamford, CT. Schopick estimates that 35 percent to 40 percent of DCA's sales come from its wide-area networking line, which includes statistical multiplexers, network processors, and modems.

Although Schopick is optimistic about DCA's short-term outlook, he notes that IBM could make the Irma line obsolete by introducing a new micro or a linking board of its own. "The long-term outlook is open to question," says Schopick.

Since some observers cite the difficulty of connecting computers as a major factor in last year's disappointing industry performance, it's not surprising that vendors of local-area networks (LANs) were outstanding performers.

3Com Corp. of Mountain View, CA, which manufactures LAN software and hardware, has been "extremely successful" with a marketing strategy that focuses on end users, says Patrick Gordon of the Yankee Group, a Boston-based market research firm. Gordon expects 3Com's products to be significantly challenged by IBM's token-ring LAN and AT&T's Starlan. But, he adds, 3Com is working to diminish the risk by making its software compatible with Starlan, and, in cooperation with AT&T, developing



a 3Com network server to Starlan.

Despite calling off a proposed merger with Convergent Technologies Inc., San Jose, CA, Gordon believes 3Com may ultimately benefit from a similar merger with a microcomputer manufacturer. "Users want a single source," he says, "and 3Com is better equipped to do that than many vendors."

Gordon is not as sanguine about the long-term prospects of Sytek Inc. of Mountain View, CA. Sytek provided the proprietary technology for the IBM PC Network, which formed the basis of IBM's LAN strategy until it announced the token-ring network. "Sytek has a tough row to hoe, because the LAN it manufactures is no longer IBM's standard," says Gordon.

Although Sytek's OEM relationship with IBM was a major factor in its 1985 growth, the company says its own sales to end users also grew. Sytek asserts that its broadband LAN offers users more connections than IBM's token-ring approach.

Another vendor that has benefited from its role as a supplier to IBM is Stratus Computer Inc., a maker of fault-tolerant online transaction-processing systems. IBM's decision to market Stratus computers has not only given Stratus a huge new distribution channel, but has attracted many new direct-sale customers. Still, Ron Slate, a spokesman, estimates that more than 75 percent of its 1985 revenues were from direct sales. "IBM has been like the 'Good Housekeeping Seal of Approval' for us," he says.

Slate expects Stratus to benefit from increasing demand for fault-tolerant systems because there are only two suppliers of the systems: Stratus and archrival Tandem Computers Inc., Cupertino, CA. Omri Serlin, a consultant with Itom International Co., Los Altos, CA, agrees that the market should continue to enjoy "substantial growth" but doubts that Stratus can continue its dramatic growth rate as its revenue base expands.

Rounding out the list of Up & Comers is Symbolics Inc., the first vendor to score success in the budding artificial-intelligence market. Symbolics markets Lisp-processing workstations, used in the design of complex computer systems.

Symbolics faces a competitive challenge from more traditional computer vendors offering similar products, such as Texas Instruments Inc. (Dallas), Digital Equipment Corp. (Maynard, MA), and Xerox Corp. (Stamford, CT), says Roseann Stach, an artificial-intelligence analyst with Dataquest, the San Jose, CA, market researchers. But Stach says Symbolics has been able to maintain a technological lead, which will enable it to grow by selling its products to researchers and advanced systems developers.

If past experience is any indication, it's a good bet that these Up & Comers will appear among the top-ranked vendors next year. Four of last year's Up & Comers achieved that distinction this year. □

UP & COMERS

Company	'85/'84 Growth (%)	'85 (000)	'84 (000)
Iomega Corp. (Stamford, CT)	123.9	$115,515	$51,600
Sytek Inc. (Mountain View, CA)	115.9	95,000	44,000
Stratus Computer Inc. (Marlboro, MA)	90.2	80,164	42,140
Symbolics Inc. (Cambridge, MA)	72.1	90,805	52,758
3Com Corp. (Mountain View, CA)	60.2	52,000	32,458
Digital Comm. Assoc. Inc. (Norcross, GA)	54.2	104,113	67,537
Ashton-Tate (Torrance, CA)	52.6	104,771	68,654

To qualify as a Computer Decisions Up & Comer, vendors must have marketed a general data processing product, had more than $50 million in revenues for 1985, and experienced a sales growth rate of at least 50 percent over 1984's.

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YEARNING FOR THE GOOD TIMES

For some vendors on the *Computer Decisions* 100, sales did not slump last year, they plummeted. Micromaker Commodore International Ltd. heads the list of poor performers, with fellow micro vendor Apple Computer Inc. not far behind. The bottom fell out of the home computer market at the same time both vendors discovered few corporations willing to purchase non-IBM-compatible micros in large quantities.

Commodore is gambling that its new micro, the Amiga 1000, can turn both the home market around and spark corporate interest. But despite receiving critical acclaim for its multitasking, graphics, and audio capabilities, the Amiga has suffered from a lack of available third-party software.

Apple has also discovered it's difficult to go it alone. Corporate users are not flocking to buy Apple's Macintosh.

The dominance of the IBM Personal Computer has hit office systems vendors equally hard. Seeking the versatility and low-priced performance of micros, users have turned away from traditional word processing systems, causing Wang Laboratories Inc., CPT Corp., and NBI Inc. to each suffer a drop in sales and earnings.

The price/performance advantages of smaller systems have also struck a blow to old-line computer-aided design and manufacturing vendors.

Another market particularly hard hit was plug-compatible peripherals. Control Data Corp. and Storage Technology Corp. are struggling to survive after IBM introduced its 3380 double-density disk drive.

Another industry giant delivered a body blow to vendors of private-branch exchanges. AT&T introduced an upgrade to its PBX system, clobbering sales to Northern Telecom Inc. and Intecom Inc., among others.

Those who were hardest hit by the computer slump of 1985 have already recognized, "downsized," and refocused on traditional strengths to face the challenge ahead. They face tough fights as the slow demand that cooled dp markets last year continues. Unless industry-wide demand begins to boom, 1986 will leave these vendors yearning for good times once again. □

HARDEST HIT

Company	'85/'84 Growth (%)	'85/'84 Rank
Commodore International Ltd.	-34.0	22/13
Datapoint Corp.	-30.9	39/28
CPT Corp.	-22.0	87/63
Computervision Corp.	-20.6	36/31
Diebold Inc.	-16.8	82/60
Storage Technology Corp.	-16.7	26/20
The Racal Corp.	-13.9	45/40
Paradyne Corp.	-12.9	50/45
NEC Information Systems Inc.	-8.0	70/57
Dun & Bradstreet Corp.	-7.7	99/82
Northern Telecom Inc.	-7.7	29/25
Apple Computer Inc.	-7.6	10/9
Intecom Inc.	-6.1	94/80
Tektronix Inc.	-5.1	41/39
Schlumberger Ltd.	-4.9	60/51
Data General Corp.	-4.4	14/12
NBI Inc.	-2.8	72/64
General Electric Co.	-2.3	21/18
Control Data Corp.	-0.3	7/5
Wang Laboratories Inc.	0.3	8/8

Acknowledgements: *The* Computer Decisions *100 is ranked by data processing revenues as defined below for the 12 months ending Dec. 31, 1985. If a corporation has an unusual fiscal year, revenues from the four quarters ending before December are used.*

Only vendors that primarily sell directly to end users were ranked among the Computer Decisions *100. Vendors that primarily sell to original equipment manufacturers were excluded. Also excluded were revenues derived from internal sales.*

Wherever possible, Computer Decisions *attempted to obtain information directly from vendors. For those corporations who did not provide assistance,* Computer Decisions *turned to knowledgeable analysts.*

Data processing revenues are defined as the sale or rental of mainframes, minis, micros, disk and tape drives, other peripherals, CAD/CAM/CAE systems, word processors, data communications equipment, such as modems, multiplexers, and digital and data PBXs. Also included are software, maintenance, data processing services, and power and environmental control equipment sold specifically for use in data centers.

Excluded are revenues related to common-carrier communications, electric and electronic typewriters, electronic cash registers, instrumentation, semiconductors, board-level computers, printed circuit boards, automatic test gear, forms, papers, and revenues derived primarily from leasing and retail operations.

Computer Decisions *is indebted to the following market researchers, brokerages, and consultants for their assistance: International Data Corp., Framingham, MA; Dataquest, Cupertino, CA; Northern Business Information, New York; Infocorp, Cupertino, CA; Future Computing, Dallas; Magnetic Media Information Services, Chicago; Disk/Trend Inc., Mountain View, CA; Yankee Group, Boston; Interconsult Inc., Cambridge, MA; Frost & Sullivan, New York; Drexel Burnham Lambert Inc., New York; Smith Barney, Harris Upham & Co., New York; Paine Webber Inc., New York; Prudential Bache Securities Inc., New York.* □